THE AUSTRALIAN HOMEBUILT SAILPLANE

Editors: James Garay / Peter Champness

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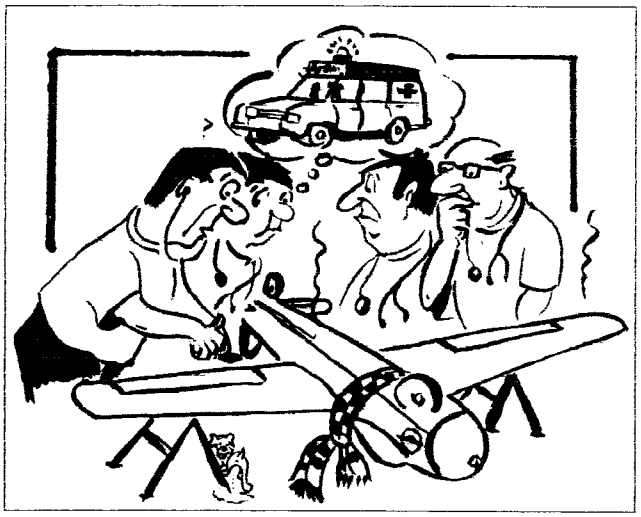
Editorial



G'DAY MATE!

Once again I sit here in front of this 17 inche screen (computer monitor) trying to address a few words to you all. It's already been nine years since I took on the task of Editor of this humble journal...it seems like it was only yesterday. This is your issue number 37 and just to remind you all subscriptions are due for renewal, if you are reading this journal and it's marked ***Complimentary Copy*** on the first page, it means that you have not renewed your subscription.

The subscription is: for Australia AU$ 20.00 and Overseas AU$ 25.00.

I can not leave out mentioning the support of Peter Champness, who is helping me with the production of this journal, the help is really making a difference.

In this issue you will find very good articles written by Peter Raphael (The famous Erudite), Alan Bradley, Allan Ash, Malcolm Bennett, Robert Marriot, Peter Champness and some excerpts from the Internet.

My "Woody-Roo" has been under surgery to correct the angle of incidence on the tailplane. Doctor Malcom Bennett and Doctor Peter Raphael did the surgical intervention leaving the patient out of action. It is now resting and fully recovering with tender loving care. Read the full report in this issue page 6.

Also Malcolm Bennett on page 12 talks about trimming devices. Recently on the 14th of May we reassume having the yearly "Symposium" by members demand, this time the Topic was "EXPERIMENTAL" and was a very interesting venue at the Club House Bacchus Marsh Airfield. Read the full report by The Erudite on page10 " EXPERIMENTAL OR JUST MENTAL"

The full Symposium is available for the subscribers in DVD or VHS/PAL.
DVD.....AU$ 15.00 included postage.
VHS/PAL.AU$ 20.00 included postage.
Order form available on the last page.

Enjoy the reading.

James Garay & Peter Champness.

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Inside This Issue

MAIL BOX

Dear Jim,

Here included my fee for my subscription 2004=2006.
The little extract from my letter that you printed in the last newsletter issue #36, regarding the "Flying Flea" glider got me a few phone calls inquiring about the subject and I sent a few pages of information as requested.

I am sure that most people can not believe that such a small aircraft can fly and soar. I am pleased that a fellow Queenslander has taken an interest in this unusual little aircraft and I hope he will decide to start building one soon.

I will write more about the "Flying Flea" soon.
Regards! Andre Maertens.

Hi Jim,

Please find enclosed money order to cover my sub for the next year.

How ya going old mate! Hope all is well with you and family.
I've been flying a lot of radio models and not much full size lately.

I'll catch up with you out at Bacchus Marsh some time.
Regards. Doug Cole

Dear James,

Just a short note to let you know what has been happening. I have started flying the Carbon Dragon again after I found someone to tow me. As the site is around 250 Km from home, I plan to fly at least once a month.

I have rejoined Southern Cross Gliding Club at Camden after an absence of four years. I do plenty of powered flying now. My wife Eileen and I flew to Broken Hill at Easter. That was rather a thrill. On the way to Cootamundra we passed several aircraft flying to the Narromine air show and listened in to the radio conversations.

It was good to catch up with Peter Raphael (The Erudite) and Malcolm Bennett at the Border Town Vintage Regatta, not having seen them for about five years. Unfortunately the weather was turning nasty so I had to leave in a hurry. Perhaps I can catch up with you at next year's regatta.

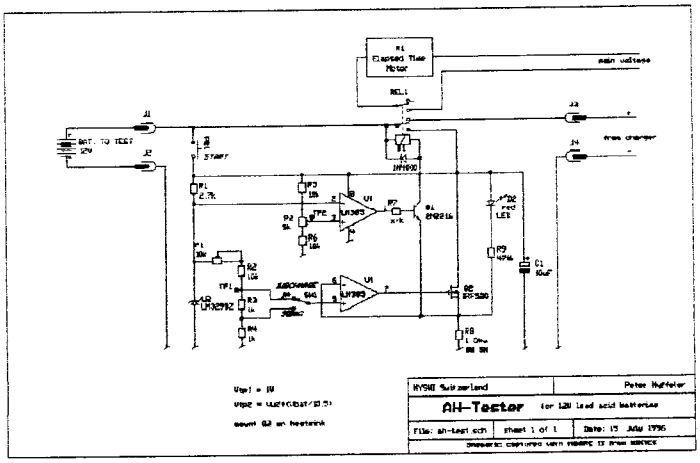
Please find enclosed my subscription for 2005-2006.
Kindest Regards. Graham Betts.

TECHNICALITIES

Ampere Hour Tester

for 12V Lead Acid Batteries

OK,so what, you ask, is an electronics article doing in a sailplane builders magazine?. Well, firstly not many skilled individuals could resist the opportunity to make something different and secondly, the practical application is most suitable to maintaining our equipment in good order. Few things could be more annoying than losing power to ones electronic instruments mid flight and with a device like this the likelihood of battery failure can be minimized. Knowing that your battery has sufficient capacity or is nearing the end of its useful life is possible with one of these devices and in a club environment keeping tabs on a collection of batteries is much easier. If you don't feel up to the task then find some electronics savvy friend and coerce them into building one for you. The Elapsed Time Meter can be as simple as a $10 digital stopwatch with the contacts wired out.



This tester may be a helpful tool for your club. The tester discharges the battery with a constant current of 0.5 A for small batteries (< 5 Ah) or 1 A for larger batteries down to 10.5 Volts and connects them afterwards to your charger for recharge. The discharge current times the elapsed time is approximately the Ah capacity of the tested battery. Of course the battery to be tested must be fully charged before starting the test.

1.-I presume the FET (Q2) will need a heat-sink, as it will dissipate approximately 12W when discharging at 1 Amp ?
2.-R9 should be 470 ohm, not 470 K

What should the value of R7 be ?
Depends a bit on what current is drawn by the relay coil.
A typical small PCB mounted relay would draw about 13 mA.
So to ensure that Q1 is in saturation, its base current should be about 1.3 mA (1/10 of the collector current is a good rule of thumb for saturated switching transistors) this gives R7 = 12/ 1.3 K-ohms approximately.
i.e. R7 = 9.2 K Probably use R7 = 10 K, as an easily Obtainable value (or 8.2 K if you are nervous!).
(The relay I based the above on is a Fujitsu type FBR46 with 12v coil, available from Radio Parts here in Victoria, Australia)

WHAT'S NEW?

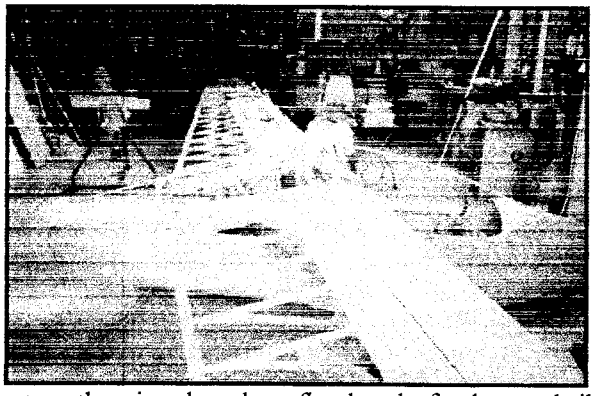
Bradley Rambles Some More

By Alan Bradley.

My last ramblings were in the December 04 issue when I said, "I am the only one who can see progress" until a week or so ago it was still the same situation. Suddenly things changed and friends actually acknowledged that perhaps I have been working.

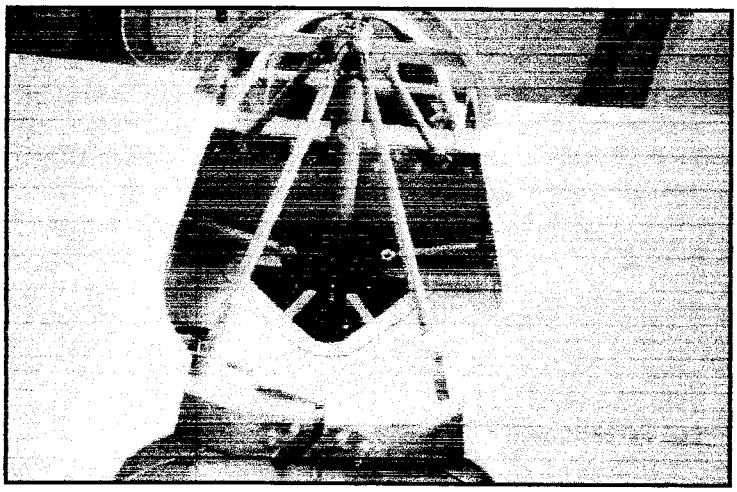
Back to the December issue. I expressed my concern that Marilyn was showing signs of thinking that she deserved a new caravan. At

the time I was promoting the virtues of our well proven existing van, subtly referring to all my good deeds which had built up a huge credit of "brownie points" over the last 4 years. Women are wonderful creatures but have an incredible knack of not beating about the bush. Suddenly I heard those dreadful words "If..! You can have a NEW GLIDER I can have a NEW CARAVAN". I suggested I could build one after I complete my Woody. We sold the old van the next weekend and ordered a new one the next week. She got her new van at Christmas. My Woody might be finished next Christmas.



At this stage the wings have been fitted to the fuselage and ailerons, spoilers and wing tip wheels connected through to the cockpit. The turtle deck has been framed up to match the canopy frame, which is also ready for final fairing. The engine mount has also been installed and I plugged the motor in a couple of days ago to check the prop tip clearance on the turtle deck. After a final fuselage inspection I was able to close up the flat deck beneath the turtle deck framework yesterday.

I have hinged the canopy at the front and the jettison arrangement looks like it is going to work. The steerable tail wheel has also been fitted and likewise looks satisfactory.



In between getting the caravan ready for our annual pilgrimage " mad May departure". I have been looking at the cockpit fit out. Mal Bennett came up with a simple idea for seat back adjustment and I will certainly copy that.

I had made a mockup of the fuel tank, which fitted in the opening in the main bulkhead, but I found the motor support tube is better close behind the main bulkhead with the aileron bell crank behind it. As a result the tank can no longer be installed where I intended it. I am currently assessing 2 other alternatives – one up in the turtle deck area, the other in front of the main bulkhead. The other odds and ends look like they will fit ok although the instrument panel is looking a bit squeeze.

As the caravan needs quite a lot of work done under warranty by the manufacturer in Melbourne, we have decided to come over and attend the experimental symposium, have the work done and then go on to Queensland. I look forward to putting faces and bodies to the names in AHS.

HINTS & TIPS

The Air Brush Trick

By R.S.Hoover

It's not much of a trick. But then, it's not much of an air brush. $4.99 from Harbor Freight. #6131. Little jobbies made in Taiwan, but not very well. made, that is. Oh, it'll blow paint. Any airbrush will blow paint.

Air brush is a siphon-type spray gun. The paint is in a little screw-top jar that plugs into the gun. The gun is about the size of a ball-point pen. The jar has a hole in the lid so the thing is open to the atmosphere. The jar hangs under the nozzle of the gun. To make it blow you press a little button on the gun. Air blows across a tiny orifice positioned in the throat of a venturi. The orifice is actually a needle valve but we'll get to that in a minute. A suck-up tube runs from the orifice down into the jar of paint. When Mr. Bernoulli reduces the pressure on the venturi end of the suck-up tube, Atmospheric pressure pushes the paint up the tube and out the orifice, where the stream of air blowing past atomizes the paint and blows it out the end of the gun. So maybe we should call it a push-up tube.

There's not much in the way of control. The paint comes out in a circular pattern, about the same as you'd get from a spray can. And while you can't control the shape of the pattern, you can control the size of the pattern. You can also control how much paint you deliver by adjusting the air pressure. Plus, you can thin down a thick paint; lay it on in thinner coats. Or leave it thick. Air brush don't care. Thick stuff just takes more air pressure. And comes out in bigger particles. Air brush will spray molasses if that's what you want to do.

So there you are with this itty-bitty spray gun. Jar only hold two ounces. If you're an artist, you buy a lot of jars, fill them with different colors of paint; Keep on Trucking and all that sort of thing. To spray a different color you unscrew one, screw on another, after flushing the suck-up tube in a jar of thinner in between. Just open up the needle valve to flush it out good.

Of course, two ounces isn't a very useful amount, not if you're building airplanes. But just as artists use different bottles, so can you. Use larger ones. I use gravy jars. Heinz. used to have 57 Varieties. Gravy jar holds about six ounces. I tried Spanish olive jars for a while but they didn't have the right wrist action. Some buys use baby food jars but I've become confirmed Gravy Jar Man. You can't use a really fat jar because the air hose screws on to the bottom of the gun and gets in the way. But you can use a tall skinny jar, which is what I did during my Spanish Olive period.

MAKING A BIGGER JAR

Got a 7mm deep-socket? Take the air brush jar apart. No, not the gun, the JAR. You'll have to pull the suck-up tube off the fitting. If it's stuck, heat it. Don't damage it, you'll need it later. Once the

tube is out of the way use your 7mm deep-socket to loosen the nut holding the suction tube fitting to the lid. Take it apart and keep track of the washers.

Got a Unibit? A Unibit makes drilling holes in thin stock a breeze. Your new lid is thin stock. Drill a pilot hole for the Unibit then open it up to accept the air brush fitting. It's about 6mm in diameter, which is close to 1/4" so try that.

While you're drilling, put a #60 hole in the lid out near one edge. That's your vent, the thing that lets those fourteen point seven pee-ess-eyes push the paint up the suck-up tube.

Now put your new lid together. Transfer the hardware from the air brush lid to your Gravy Jar lid. Make sure the vent hole is at right angles to the outlet of the suck-up tube. If you don't, you'll end up spilling paint all over yourself. (At 90 degrees from the axis of the spray gun, the vent hole will always be near the apex of any tilt you put on the bottle. If you position the hole anywhere else, there will be some tilt-angles you can't use.)

Your bigger jar will need a longer suck-up tube so go punch a hole in a used spray paint can. Let the residual propellant escape then cut the bottom off the can. Inside you'll find a free marble (!) and a length of suck-up hose about 7" long. That's too long for your Gravy Jar but you can cut it down. Except it's also too big around - it won't fit on the suction fitting in the lid. Metric *vs* whatever and all that. So go find the original air brush suction tube. Snip off about half an inch and slide it onto the suction fitting. Now slide the spray can tube over the smaller air brush tube. It won't want to go but it will, if you heat the larger tube and put a little muscle into it when you slide it on.

Why the tube out of a spray can? Because you need tubing that will withstand MEK and Toluene and lacquer thinner and whatever else you might use. You can buy such tubing but the minimum quantity is about five feet and it costs the earth. And there you are, with half a dozen useful lengths of the stuff inside old spray cans. Plus, you get a free marble.

So how long does it have to be? It should reach the bottom of your Gravy Jar. Not smack up against it, but pretty near. You'll also need several extra jars plus one extra lid. (Why an extra lid? Because you've just converted one of them to your sprayer-lid.)
That takes care of making your new lid, which is 90% of the job. But like everything in homebuilding, the remaining 10% of the job will take 90% of the time.

MAKING IT USEFUL

See that crappy little black plastic air hose that came with the air brush kit?
It's going to pull off its fittings about ten minutes after you start using the thing. So go find some fine stainless steel safety wire, put a couple of wraps around the fittings and twist them tight. Po' Boy hose clamp. Works, too. Snip off the twist and tuck the end flat. A bit of tape over the safety wire will keep you from cutting yourself. (And yes, that does happen to be a Band-Aid on my airbrush hose. No, I don't want to talk about it.)

The air brush kit comes with a fitting that connects to cans of compressed air (!) Seriously. They sell canned air at hobby shops and the like. They don't hold much air but if you're painting toy trains or model airplanes, you don't need much. For painting real airplanes, on the other hand, you need a bunch air. Maybe two bunches, before you get it all done.

To provide air to the spray gun you need to buy an adapter that will mate with the fitting on the hose in the kit. Harbor Freight sells one, #P-1655. It's got a male thread on one end to match the fittings on the air brush, and a female 1/4" NPT on the other. To make it match my air line I added a quick connect. Harbor Freight sells those too but I don't know the number.

The 1/4" airline adapter (P-1655) allows you to use your air compressor. Or any other source of compressed air that has a 1/4" NPT fitting hanging off the end. Such as a big tank of air for refilling a tire. Which will blow more paint than one of those itty bitty cans from the hobby shop.

The air brush is sensitive to air pressure. If using canned air, the lid has an adjuster built in. But when using an air compressor, air tank or whatever, you'll need to get yourself some form of pressure control in the line. Most of the time you'll only need five or ten pounds but with thick stuff you will need as much as 90 psi. Because the gun is easy to adjust you can get by with a very simple restriction-type 'regulator.' (It doesn't do much regulating but it does cut down the pressure.)

IS THIS REALLY PRACTICAL?

That depends on your financial situation. Sixteen ounce rattle can of ZC primer only has about seven ounces of paint. That makes it pretty expensive.

Plus, the nozzle is always clogging up and every time you want to use yellow all you got is green or visa versa.

Quart of primer contains a quart of primer. Cut it 1:1 with reducer, you got two quarts. That's sixty-four fluid ounces and that works out to about one eighth the cost of using rattle cans.

And then there is other stuff to paint, such as steel parts, which get a baked coat of primer then a baked coat of gloss black or whatever. Having a little spray gun that's easy to set up and simple to clean makes blowing a little paint quick and inexpensive.

SPARE PARTS

At five bucks a copy you can be pretty sure your airbrush won't outlast the Pyramids. And it is going to accumulate some wear. It's got a couple of teenie tiny O-rings that probably won't cost more than ten dollars each, plus the hernia you'll get from digging through the McMaster-Carr catalog trying to find them.

So buy two kits. The second is to provide spares for the first. At five bucks a pop it's the logical way to go.

USE, STORAGE & CLEANING

Get yourself a box about a foot on a side. Cardboard is okay. Give it a coat of paint; maybe stiffen it up with some stringers. Use it to store your Air Brush Kit. Keep the thinner and spare jars and spare parts and stuff like that in the box, along with your pipe cleaners.

One of your jars should be filled with thinner. Lacquer thinner will do to clean up after most primers. The other jars are filled with whatever you want to spray, from kerosene to zinc chromate. To

give the glass jars a bit of protection, wrap them with several turns of old fashioned friction tape – the rubberized cloth stuff.

Store your pre-mixed primer, tightly sealed, in the refrigerator. If you've got kids in the house, store the stuff in an ammo can out in the shop. Keep it on the concrete deck, covered by several layers of cardboard to keep the stuff cool.

Every time you use your spray gun you got to clean it. Takes maybe five minutes, tops. Here's how.

Unscrew the paint jar, put the lid on it and put it back in the refrigerator. Plug your sprayer lid into your jar of thinner and blow thinner into a rag or can until the suck-up tube and nozzle are clear. Get a little thinner on a rag and find your pipe cleaners. Dip a pipe cleaner in thinner and have it ready.

Shut off the air, disconnect the hose and put it away in the storage box.

Take a look at the gun. See that little circlip? Open up the screwdriver blade on your jackknife and pry off the circlip. Now you can push the brass needle valve down through the body of the gun. Unscrew the needle valve as you go. The cone of the valve stays on this side, only the needle part pushes down & out of the gun. Unscrew the nozzle.

That's it. Three parts. Four, if you include the circlip.

Use your pipe cleaner to ream out the needle valve and the nozzle. Get ALL the paint out of there. Use the rag to wipe any paint off the suck-up tube and sprayer lid.

Once everything is clean, put it back together and store it in the box.

MAKING A SPRAY BOOTH

The last part of your spray-paint kit is the spray booth, which looks suspiciously like a cardboard box. Hang it or nail it near to a window and rig some dryer ducting from the box to a panel in the window – you want those fumes to end up in the neighbor's air conditioner intake, not in your shop. Rig a small fan to pump air out of the booth and into the ducting. In case you hadn't noticed, a fan is an air PUMP. To make it work like a pump wire & tape it to the wall of your spray booth. On the outlet side, rig a plenum chamber (which also looks suspiciously like a cardboard box) and fasten your ducting to the plenum chamber.

Making a spray booth is one of the few times in your life when you can use duct tape on a duct. Enjoy.

You don't need a very big fan because you aren't using a very big spray gun.

The boxer fan out of a computer power supply will work but most of them run on 12vdc and are noisy. I use a cheap (cheap!!) import desk fan, about six inches in diameter.

To make cardboard useful it needs to be stiffened with wooden stringers. Lath will do fine. Use urethane glue and staples. Once the glue cures, give the box a coat of white house paint and repaint the interior periodically, not only to renew the white surface but to bind up any over-spray residue. After you finish your plane, cut the box up and get rid of it.

When adding stiffeners to your spray booth, be sure add a couple to the inside, up near the top of the box. Rig a couple of wires up there. To paint stuff you'll typically hang it form hooks of bailing wire and use a wand of the same stuff to hold the part in position while you shoot it with paint. Most primers dry in a matter of minutes but it's a good idea to rig a curtain on the front of the box so you can leave parts hang while they dry. In a cold or damp climate, adding a door and a couple of light bulbs NEAR THE BOTTOM will turn your spray booth into a drying booth.

The spray booth is to keep from blowing toxic residue all over your shop.
Everyone worries about hexivalent chromium but the truth is, alkyd and epoxy resins, when in aerosols, are just as bad for you, although for different reasons. So even though you have a spray booth that passes your problems on to the neighbors, any time you blow paint you should dress for the occasion. That means an air mask or industrial quality respirator, and gloves that are impermeable to the thinner & vehicle in whatever paint you're spraying. (And this applies to rattle cans as well.)
Most volatile vapors are explosive. Try not to weld while painting, nor to paint while welding. And the smoking lamp should be out.

PASSING YOUR PROBLEMS ALONG

Back when Tony Bingelis was painting his Falco one of his neighbors complained about the smell. I told him he didn't have a big enough cat box.

The average cat box is 20" long by 14" wide. So you build a box 20-1/2" long by 14-1/2" wide by about 30" tall. The box slides down over the cat box, which is four inches deep and contains 2" of water. Inside the box you've built, there are five partitions spaced about 3" part, except for the input and output which are about 4".

Two of the partitions are open at the top but extend down INTO the water. The other three partitions are sealed at the top but only extend downward to within one inch of the water.

Any place you need to form an air seal, such as along the edges of the plastic cat box, cut up some urethane foam, give the surface a touch of upholstery glue and stick it to it.

On the output of your cat box you put a large fan positioned to suck air through the box. The inlet is on the top of the box at the far end.

What you've just built is a kinetic air filter. Each time the air is forced to reverse direction, which it must do to negotiate the partitions, heavier particles will tend to collide with the surface of the water and stick there.

Even a one cat box unit is surprisingly effective at eliminating odors and trapping paint particles. But if one unit isn't enough, add another to either end. When combined with a labyrinth filter at the input (ie, a stack of furnace filters) and an electrostatic particle precipitator on the output, you can get clean room conditions with only seven reversals (ie, a two cat-box unit).

If you rig such a unit for your spray booth the odds are your neighbors will never know when you decide to blow a little paint, since none of it – nor any of its vapors – will get out of your cat

box.

The Cat Box Principle also applies when painting the entire airplane. Rig an air dam across the garage so the door comes down onto the dam and install the cat box in the middle. Seal up any gaps with cardboard, foam and duct tape.
To get a flow of air into the shop, use a window or door on the opposite side of the shop. Build a light frame of wood to fill the doorway or window. Glue furnace filters to the frame. Put the frame in place any time you want to blow paint. It won't stop a sand storm but it'll keep out the bugs and most dust.

A WHIFF OF REALITY

So you go down to the local EAA chapter and tell the folks about your nifty little air brush and your cardboard spray booth and your cat box air filter...and everyone will tell you what a bad idea it is. Spray cans are better. Zinc Chromate is evil incarnate. And if you use 6061 and pop rivets you don't need corrosion protection, or that noisy air compressor or all that other stuff. Besides, if the designer wanted the part protected, it would have arrived that way IN THE KIT.

About there I realize I've stumbled in to a meeting of the Dunkin Donut Kit Assembler's Association and slink back to the shop to continue making curvy bits out of flat bits. And giving the curvy bits a spritz of ZC when I get them done, because, not having a zillion dollars for a kit (or even $10,000), I've no idea how long the part will sit on the shelf before it can be assembled. That spritz of ZC will keep it from going bad. What I DO know is that building a Teenie Two will cost me about $500 and a CH-701 about $1,000 (less the engine in each case), because I'm only paying about two bucks a pound for the materials, right down to the solid aircraft rivets, gleaned from various surplus sources at scrap metal prices.

Which is why a $5 spray gun and cardboard spray booth and cat box air filter make good sense to me. An' besides, I get a free marble.

SHOP TALK

More on The Jim's "Woody-Roo" Trim

By Peter Raphael

A few weeks back we went down the path of fitting a spring trim to the Woody Roo. This was instigated by the fact that the glider was not trim neutral in flight. Subsequent test flights indicated that there was still a nose down tendency and with the elevator being held slightly up to hold trim speed. As weight and balance was within spec. all indications were that there was a rigging problem. Comparisons done with the drawing and measurements obtained from HNW revealed there was excessive positive incidence in the stabilizer, the leading edge being too high. Jims glider was built with a removable tailplane and therefore the fix was relatively simple.
The tailplane is retained by two brackets attached to the rear stabiliser spar and two removable bolts attach these to the fuselage sides. Another single bolt vertically through the stabiliser at the leading edge provides the third attachment to the fuselage. It is this bolt that is the key to the adjustment. A guide bush set into the fuselage and below the stabilizer limits the degree by which the leading edge is lowered; therefore it is simply a matter of reducing the height of this bush and checking the results. A little work on the lathe and some sanding of the fuselage fairing saw things come together, and some measurements against the fuselage longeron established that incidence was now in the ballpark. While little effort is required to maintain speed control in the Woody's it is far more efficient to have the control surfaces working in harmony. Now lets go and fly it and enjoy our efforts!

FLYING THE WOODSTOCK

The following is excerpted from an initial draft by Chuck Rhodes, Mitchell Wing pilot of many years and Editor of the Ultralight Soaring News, the official publication of the United States Ultralight Soaring Association.

HANG GLIDING PIONEER / ULTRALIGHT SAILPLANE PILOT WINS BIG AT HOBBS, NM REGIONAL & NATIONAL SAILPLANE COMPETITION

World Class Ultralight Soaring pilot and current Champion, Gary Osoba, had never competed in a SSA (Soaring Society of America) sanctioned meet before. That did not stop him from taking his home-built, Jim Maupin-designed, FAI Ultralight Category "Woodstock". A sailplane of wood and fabric construction, to Hobbs, New Mexico. Thus, he competed in the SSA's Regional Sailplane and National Motorglider Soaring Competition over the June 22 through 26 period.

In the entire history of the Sports Class competitions they had never had a (relatively speaking) low performance glider like the Woodstock compete with any success in good conditions. Designs with glide ratios of around 60:1 ($180,000 investments) would be in attendance, as opposed to the Woodstock's meager 24:1 published maximum glide. They said that no matter what the handicap, if the wind blows (does it ever at Hobbs!), or thunderstorms blow up, you just can't get around the course and make it back in a "low performance" glider like the Woodstock.

Sooooo!....Gary was told that it was pointless to enter the Woodstock in the competition there. Being Gary Osoba, this was just the kind of challenge that he was looking for. The opportunity to pit his extensive thermal and Microlift soaring expertise, gleaned from years of hang gliding and ultralight soaring in the Carbon Dragon, against some of the nation's best competition sailplane pilots.

It was quite a sight....some 60 slippery composite ships and then the little wood and fabric Woodstock in the middle of the grid. It was reported that one competitor turned to the other on the first day and remarked "What does that guy think he's doing here with that little toy glider?". After the contest, Chip Garner, a very experienced competition pilot, reportedly congratulated Gary in a very sportsmanlike fashion. He said that "What made the whole performance awesome was that with the really strong conditions, the disparity between the high performance sailplanes and the little Woodstock should have grown larger. You're not supposed to be able to win *anything* in these strong conditions".

According to experienced contestants, these were the best of conditions which have been experienced during contests at this site... 16,500 to 18,000 msl cloudbases daily, and sustained climbs in excess of 1500 fpm. On Wednesday, the third day of the five day meet and one day after Gary won his first daily task, thunderstorms developed in the area.

At this point, Gary and the Woodstock were about 50 miles out. Then, the cloud mass he was working started blowing up as well. No matter how fast he flew, Gary couldn't outrun the shadow line as he raced to get back to the field and its finish line. The headwinds aloft built to 30 mph and the Woodstock just couldn't make it back! The land out earned him only 375 points out of what was each day's 1000 point maximum, a major set back. Gary was told it would be impossible to come back from that even if he won the remaining two days, but he didn't give up.

What made things especially difficult was that Dick Johnson, the winningest pilot in US Sailplane history with 11 National and 3 World Titles, decided to fly in Gary's class at Hobbs this year. Johnson has decades of experience in the Midland,TX/Hobbs, NM region and recognized the thunderstorm picture early.... he moved way out west into the blue and waited out the whole cycle...winning by a large margin that day. Normally, with Dick's consistent and finely honed skills, this would have sealed the event. But Gary and the Woodstock flew well and won the next day, bringing his total to 2 out of 4 day wins.

Even so, he remained more than 200 points out of the lead which was still held solidly by Dick Johnson as the final day approached. What this meant is that he would not only have to win on day 5, but also would have to win in a truly big way....finishing some 125% faster than Dick with the rest of the field below him. Again Gary was told that this was really not possible to do. However, with nothing to lose, he simply relaxed on Friday and started flying more like a hawk than a sailplane... his type of flying!

Up to this point, Gary had been mixing personal technique with traditional sailplane technique ...good results, but not good enough. On this day, and his final chance to win, he resorted to Microlift Techniques, various methods he has pioneered, over and over. He screamed around the course. Later, Gary said "It was one of my most accurate flights ever, given the conditions". He did win the day big, at an adjusted speed of 91 miles per hour for a 3.25 hour task while returning to his start point...big enough to pass up Dick (just barely) and gain the crown.

Gary was the only winner of any class to win 3 out of 5 days, and every day the winner was invited to give a talk to the assembled pilot's at the AM meeting. Needless to say, Gary got on his soap box and took advantage of the great opportunity to extol the virtues of ultralight sailplanes and their ability to utilize Microlift soaring techniques. People were really intrigued, and he got a wonderful reception overall. One crusty old competitor said this was the most exciting thing to happen at a contest in decades and that this might start to breathe some life into the sport again. Dave Mockler, who won in the 15 meter racing class told Gary"You know, you're really lucky. A lot of these guys attend 4 or 5 contests every summer for 10 to 15 years before their first win." Then, after thinking for a moment, he said "Maybe it wasn't luck after all." The field included four gliders from the US Air Force and their top glider pilots... two motorgliders and two glass ships.

In summary Gary Osoba did an amazing thing by winning this contest. He proved that a little wood and fabric sailplane can beat the world's best sailplane pilots in the most expensive glass ships at their own game. He did this not because he is necessarily a better pilot but because his hang gliding and Carbon Dragon experiences have made him a master of Microlift soaring technique.

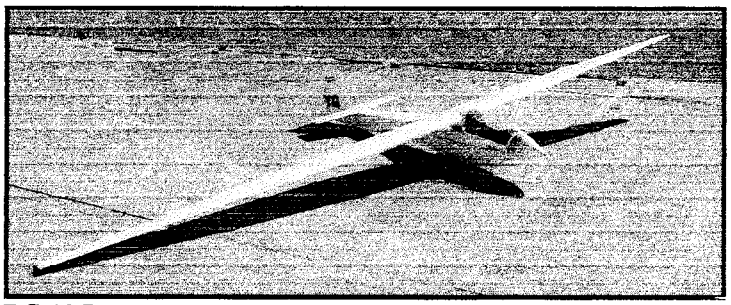
The Contest Director's Meet Summary on the SSA's Internet site credits Gary's hang gliding history in this regard... a first. He truly does transform his mind from human to hawk. Without those years of experience in hang gliders and ultralight sailplanes and his intimate knowledge of the world of micrometeorology, he could not have done it. Congratulations Gary, and you have given another big boost to Ultralight Soaring.

A Wooden Whiz

By Robert Marriot.

Jim! Our Editor, asked me to write. How could I refuse?

So I look at the aircraft in the hangar upon which I am working and think to myself...(*#*=????).....
"Which of these would be of interest to homebuilders?".
A Caproni A21SJA Jet self launcher?.....No!
A Stemme 10 VT turbosupercharged?.....Not likely!
A beat up Bocian 1E?.....May be!
Wait, over in the corner with the cobwebs. My spare time project.
A BG-12B!!!!!.....Yes, that's it!



BG-12 B.

The American sailplane kit manufacturer Gus Briegleb designed and first flew the BG prototype in 1956. It was in the days when home designer / builders of sailplanes could achieve results which were competitive with the manufactured product. A feat still possible today but only by a most psychotically determined, skilled, knowledgeable, wealthy and otherwise idle genius like yourself.... of course.

There was a range of BG's on offer. Some of the designations were:-

BG-6, BG-7, BG-8, were the early models then came the successful,

BG-12A of which 4 appeared in Australia.
(1956) It had a 3 piece 15 meter wing of 15% thickness (one centre section of which I remember being unable to budge despite full grunt). Flaps (no airbrakes) used for glide-path control.

BG-12B Of which only 1 exists in Australia, (my spare time project). (1963) This has a 15.24m / 50 ft two piece, "lighter" wing of, 18% airfoil section. This variant was specifically designed as a cross country machine. Like above, with flaps, no airbrakes.

BG-12C None in Australia. In complete contrast to the rest of the BG family had air brakes and no flaps, for FAI/Standard Class.

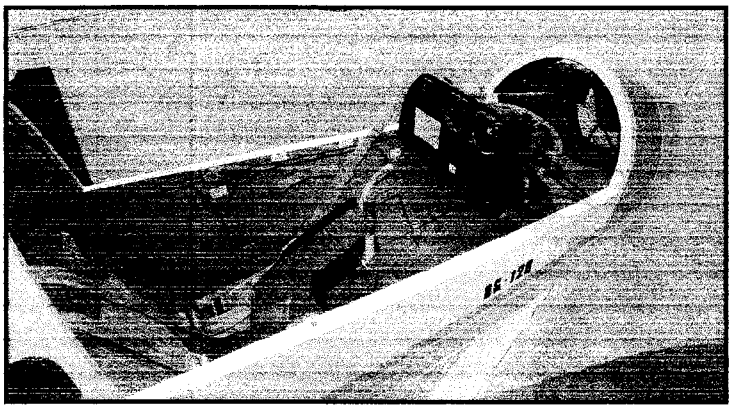
BG-12BD One registered in Australia. Sported full span flaperons, eliminating three degrees of wing twist, accomplishing the same effect by an aileron linkage applicable only in the low speed range. L/D 34 @ 49kts, Empty Wt 227kg.

BG-12/16 one under current construction in Australia. Has a newer, lower drag, fuselage and a forward swept stabilaser (all flying) tailplane with two antiservo tabs to produce good stick "feel". (L/D 36).

All BG's have a reflexed airfoil section and (except C) flaps to be used in place of non existent airbrakes. Other than metal fittings the sailplane is designed to be made completely from Douglas Fir, structure and ply.

A builder had the option of purchasing plans and building from scratch; purchasing individual parts or assemblies (spars being popular) or buying the whole aircraft in kit form. One such builder informs me that the kit as it arrived from the USA contained every single part cut to exact size, finish sanded and included every gusset, nut, bolt, tube etc.

The BG-12s had an unfortunate introduction into Australia.



A "personage" involved with early BG-12A's determined that an aircraft designed for cross country performance could not possibly achieve such without a mirror finish surface on the wing. This he concluded could not be achieved without the application of fibreglass to said wing surface and much polishing. {The designer was said to have prototyped the wing with fibreglass but issued the drawings without specifying same. (I wonder why?)} Weighing such a fibreglass modified aircraft, built in Australia, revealed it to be 198lbs overweight of the designers' specs, and this was typical of the fibreglass mod.

The builder(s) of the BG-12B in this shed (my project) ignored the fibreglass fad and constructed their wing as per the designer. None the less the wing is "heavy" for a 15m woody. This is because the spar is full depth laminated solid, the ribs are profile cut out of 3/8" ply and the skins are 3/16" ply. All pieces are generously epoxied together. THIS is why the BG-12 was nicknamed the "Lead Sled. Ingo Renner states that "If you want to fly cross country in a BG you do not need water ballast". Horses for courses I guess!

I have to say that this is my first close up look at a BG. In comparison with your average glasflugel, I find the BG -12B fuselage very light. Fully rigged on its' main wheel I can pick up the tail with my index finger and ground handling is easy. Still, three muscular blokes are needed to handle a wing half without doing a disc.

Constructing a BG would be a relatively simple exercise for someone with wood skills who fancied himself able to build a small boat.

The one feature of the design of the BG that I particularly like is the main spar to main spar attach method. It is basically a conventional strap to strap system except that there are four pins to lock the straps together. The magic is that the pins are tapered and oriented inward which means that when you bolt the pins in place, via a bolt through holes in the axis of the pins, the taper takes up any wear or slackness in the tapered holes in the straps. This ensures rock solid locking together of main spar halves and accommodates for minor wear (provided the bolts are tightened properly).

One feature I don't like about the BG is the skid / landing wheel system. When presenting to the ground upon landing the skid almost covers the landing wheel. This is a deliberate design element. The main landing mechanism is the skid. The wheel is there to help the skid along. There are no solid braces taking landing loads into the fuselage from the unsprung wheel. And as my friend Lindsay Gamble (BG-12A GRJ CFI Goulburn) says "If the tyre goes "***pop***" it comes to a stop in a big rush". That said, it still works.

Lindsay Gamble reports that on initial winch launch you need someone to hold the tail down (BG with pilot is nose heavy) and the skid is used to run up to speed for rotation. During winch launch climb the tips of his BG-12A elevate about 50 – 75 mm (not much – remember - solid spar 18% thick +14G -7G). Maximum winch tow speed is 70kts and minimum is 50kts otherwise you start to porpoise at the top of launch. On aerotow elevator control is lost about 60kts requiring a max aerotow of 55kts (an ultralight tug would do well!) . Upon high speed flight, lift is produced in the centre of the wing and as the wing washes out anti lift is produced at the outer parts to such an extent that at 120kts the wing goes rigid. "You can feel every bump, which can be uncomfortable". Full dive with full flaps produce a maximum of 80kts and an exhilarating over vertical descent. Pull out is not a problem (+14G is so comforting). Landing is very nose down due to flap extension for glide slope control. Landing flare must be judged to put you one meter or less above the ground with full flaps prior to 45kts at which speed the wing stalls and you are rudely deposited on the ground (no springs). The skid pulls you up nicely. Aileron and elevator authority remain excellent all the way down the slippery dip.

Lindsay would like to boast that his BG-12A is in the Guinness book of records for being the first wooden sailplane to claim a "fastest 500k straight run record". Three cheers for Lindsay, he's a good bloke.

The BG-12B on the other hand (15% thick two piece wing) is a different aircraft. The owner reports +/-10G, excellent handling and no smoking. Empty weight ~ 254kg and gross at 363kg provide a Vne of 119kts. Best L/D is 31:1 at 48kts, min sink of 2.5ft/sec at 42kts. Stalls are 30kts clean, 29kts with 12 deg flap and 27kts with 70 deg max flap.

Controls authority is adequate on initial T.O. with 20kts required to lift the skid. Some "out of turn aileron" is required to balance turns of 0-40 deg. Stall warning is a slight burble only. Spins are rapid and recovery is immediate upon conventional relaxation of elevator. Full flap produces 45 deg descent at 55kts and is ideal for short field landings. Flare is very controllable (usually full flap). Flaring too quickly will produce "ballooning" which is another aero sport. No aerobatics except intentional spins.

I have just completed the Form 2 on the BG-12B and it will soon be flown. I look forward to this. It is a real vintage "all wood" classic. It is up for sale in the near future (03 5874 2914)

If a potential sailplane builder was considering a project such as a Woodstock I would suggest he/she survey the above data. The BG is a very simple, basic design which is well within the average capabilities of anyone with any construction skills. Plans may be hard to get. The Vintage sailplane guys may be able to help.
Stay High.

TIMBER SELECTION

By R.S.Hoover.

OK, let's say I go to the nearest supplier who has (allegedly) got some Sitka of the correct quality. Let's say he has some boards about 12 feet long and about 6 inches square.
OK, I think I can manage a ring count and gradient as well as seeing if my spars will come out quarter sawn. after that, I'm lost. I think I can probably spot a fracture on a raw board and moisture isn't really an issue since I know someone who can kiln dry it for me, but aside from all this, what am I really looking for?

First, find the center of the tree :-)

Looking at the butt-end of the 6x6, note the curvature of the annular rings. You want to rotate the six-by until the curves are up, the 'cup' is down. if the log was quarter-sawn the center of the log will be straight down, relative to the center of curvature. It probably won't be but the following will still work.

Because a log is a cylinder you can't avoid some curvature in the annular rings across the width of a spar but you'd like to have them symmetrical; without any slope from one edge to the other, which is why you use quarter-sawing. This is because you want the stresses of flight to be uniformly distributed around the center of the spar. If there is any slope to the annular rings the center is displaced toward the down-hill side of the slope. and some portions of the spar's cross-section end up seeing higher stresses than other portions.

The amount of curvature across a 6x6 will give you some idea of the diameter of the log. Since you want the flattest possible curvature you want wood from near the outside of a log about four feet in diameter. By measuring the center height of an annular ring as well as its chord (ie, width of the timber) you can work out the diameter at that particular section of the tree. For 10 rings to the inch , for a six inch timber, a center height of about a quarter of an inch sees the tree was about four foot across at that point. Which is good. Closer you get to the core, the more pin-knots & pitch pockets you'll encounter. What you'd like to get is wood from the mature growth of the tree, after it's attained enough height so that it stops throwing out branches.

So long as the ring count is uniform, anything from 8 per inch on up will pass inspection but critical builders will often spec a minimum of 10 or 12 rings per inch. Anything more than 16 or so, the weight goes
up faster than the strength, which is why that old-growth Doug fir, with counts up to 32/in looks better on paper than in use -- the stuff runs about 40 pounds a cubic foot (!)
If all that checks out, take a look at the run-out of the grain. You can do this on either surface, once you know how it was sawn. Mil Spec calls for a minimum of 1 in 15, meaning you pick out a grain and follow it for 15 inches. If it moves more than an inch laterally in that distance, you look for another stick.

The truth is, minimum grain run-out is determined by the part in the airplane, in that you'd like to have the grain not run out for the length of the part. For example, with a 16' spar having a depth of six inches you'd like to have a run-out of 1-in-32, which would be the ideal. One in fifteen is a little more than twice that and practice has shown that's good enough.
In reality, working with wood taken from near the base of the tree (ie, where the 'cylinder' is fairly uniform), with Sitka spruce it's not uncommon to see grain having a run-out of one inch in fifteen FEET. (You really gotta love wood like that :-)

Is it twisted? (If so, you don't want it.) To discover twist, you need to examine both side of the piece, looking at the position of the grain relative to the edge and comparing one side against the other.

If the grain is twisted, the run-out on one edge will be different from the other. That's okay for bridge timbers but when you slice the balk into spars, they'll tend to turn into pig-tails. Trees exposed to the wind often have unusual grain patterns -- curves, spirals and so on.
Not the sort of thing you want in an airplane (or a mast).

Compression fractures are easy to spot in freshly sawn lumber (ie, when you have both sides of the log available for inspection) but difficult to detect after the lumber has cured. To get it to show up you need to
plane the surface. It's kind of hard to describe what a compression failure looks like but it gives itself away as an anomolous feature, usually linear and regular, that cuts across the grain. On close inspection the annular rings may appear to have been offset by some small amount and the cellular structure of the wood across the off-set portion will be compressed. You'll need about a 3x loupe to see this clearly but the usual inspection doesn't need to go that far since the
other evidence tells you what you need to know.

An honest sawyer won't sell you wood having a compression fracture... unless you work for Home Depot or whatever. (Then they'll sell you
ANYTHING :-)

Truth is, it's not as hard as it sounds. But it remains a subjective analysis in which experience plays a crucial role. Fortunately, the odds are overwhelmingly in your favor.

This has probably been about as clear as mud. Kinda hard to describe something you learned by actually handling the wood.
PS -- The literature takes a stab at explaining 'quarter-sawn' but it's pretty clear most authors have never stood there and watched it happen

PREPARING THE GLUE FOR YOUR GLIDER

Once again, cleanliness is next to Godliness. Do not use metal spoons or containers as these may react with the glue. Thoroughly clean away any traces of old glue from the containers. Paper cup are to be preferred. They are available from your local supermarket together with wood stirrers.

Only mix sufficient glue for the job in hand and rigorously observe the instructions regarding the usable life of the mixture for the particular temperature conditions at the time.

ASSEMBLY TIME.

The time available for assembly operations is also dependent on the temperature. The "open assembly time" is the maximum time available from applying the glue to the surface until the surfaces are brought together. The ***closed assembly time*** is the maximum time available from the moment the surfaces are together until the full pressure is applied. If the open assembly time is less than the maximum then more time is available for the closed assembly operation.

A minimum assembly time is normally specified as one third of the above times. This is to allow the glue to penetrate the surface. In practice the time required for applying the glue and bringing the parts together is usually sufficient.

This may sound complicated but it boils down to the fact that speed and accuracy are essential and large gluing operations cannot be carried out on a very hot day.

Always make a "dry run" without glue to check the assembly time and make sure that sufficient clamps and blocks are available. Allow sufficient time for spreading glue on both surfaces.

ACCURACY OF FIT.

Surfaces must be flat and fit together. There should be no gap when the parts are mated together before gluing. After gluing the glue should be of the thickness of a thin pencil line.

CLAMPING PRESSURE.

Correct clamping pressures are supplied by the glue manufacturer. However, for glider repair work it is only necessary to know what methods of applying pressure are satisfactory. Usually the only difficulty is to obtain sufficient pressure.

The following are some practical methods of obtaining clamping pressure:

1. "G" clamps should be used with softwood blocks to spread the load. If only a piece of plywood is used under the clamp there is a danger of crushing the job. Tighten by feel.
2. Brad strips are used over plywood. Brad length and ply strips are selected to give adequate pressure and distribution. Use packing blocks sufficient to back up the brad strips. Use steel brads in preference to brass. Do not leave brads in the timber.
3. A stapling gun can be used as alternative to brads provided the job is fairly solid. For best results use a strip of cloth to obtain full pressure from the staples.
4. Wedges and special blocks are sometimes used in jigs.
5. Small spring clamps, tourniquets, and various other methods can be used for small repairs.
6. Weights are not entirely satisfactory as it is difficult to get sufficient pressure.

Clamping must provide an even pressure over the area being glued. Clamps should not be to far apart or too close to the edge.
The sequence of tightening should start from the middle of the work, not from the ends.
A uniform squeeze=out should show along every glue joint.
Clamps may be removed when the squeeze-out is hard

Experimental or just Mental?

By PeterRaphael (The Erudite)

Ever felt like indulging in a flight of fantasy and designing and building the glider of your dreams? Throwing away the book and building that 40+:1, low budget, hi-tech solution to gilding's woes?

Well now you can!

The 16 individuals who attended the recent symposium at Bacchus Marsh and sat in on Norm Edmunds presentation of regulation AC-21 have now become the enlightened ones.

Norm is a Sport Aircraft Association of Australia Technical Counselor and Facilitator Instructor as well as the constructor of a Corby Starlet which is rapidly approaching completion. As an ATC Simulator Instructor for Air Services, Norm conducted the presentation in his professional, well structured and unhurried fashion with plenty of time for questions.

We learned that the regulations allow for construction for virtually any conceivable type of flying machine out of any material and of any size. However, these guidelines come with the suggestion that approved components and aircraft quality material be used. Again, stage inspections are not mandatory but recommended although in accordance with the "Major Portion" rule the builder must construct more than 50% of the aircraft

Aircraft constructed under these rules must be registered and have undertaken a final inspection, not to testify to its airworthiness, as that is the builder's responsibility, but to ensure that matters such as registration letters, placards, proof of construction, etc are met. Only then will a Special C of A be issued.

So how do we know if the aircraft is airworthy? This is the responsibility of the owner who will undertake a prescribed flight test regime in accordance with the intended envelope of the aircraft.

Any limitations or stipulations may be nominated in the experimental certificate issued by the Authorised Person. Upon successful completion of these tests the test pilot can then endorsed the logbook attesting that the aircraft is satisfactory in respect of these conditions. Conversely if these tests are unsuccessful then it is highly likely that no further action is necessary! The information above is a précis of the salient points discussed and I would suggest that anyone with a serious interest in pursuing this direction should avail themselves of CASR Part 21 and read it in full. This document along with many others is freely available from the www.casa.gov.au website

While these rules are available to glider builders as a self administering body of the GFA has its own guidelines that should be taken into consideration. Given that gliders do not generally operate autonomously certain guidelines should be followed and information sought in order to meet these requirements.

The GFA Manual of Standard Procedures has been developed over many years and studying a copy of this will aid in avoiding pitfalls that have befallen others over the years. As an adjunct to the morning's procedures and in the absence of John Viney who was unable to make his presentation, John Ashford CTO/A, gave us the GFA perspective on experimental construction and its management,

effectively filling in the gaps for us. Thus concluded a most enlightening morning's discussion.

Meanwhile outside, Supa-Dupa Chef extraordinaire Peter Champness had organised a barbeque and salads to take care of the physical aspects of the day. Ably assisted in no small part by his brother Hugh, the hungry horde settled in to a lunchtime discussion around the topics recently absorbed before filtering away back to more mundane tasks.

Our collective thanks must go to our Editor James Garay, the prime motivator for this event, and his son Eddy who Video Taped the whole event, Peter Champness for his logistical support and introductory duty, and to Norm Edmunds who may well have preferred to work on his project and yet was more than willing to provide us with this valuable and informative service.

Stay tuned for the next Symposium 2006 - By members demand.

Trailer Talk 6 - Trailer Tilting

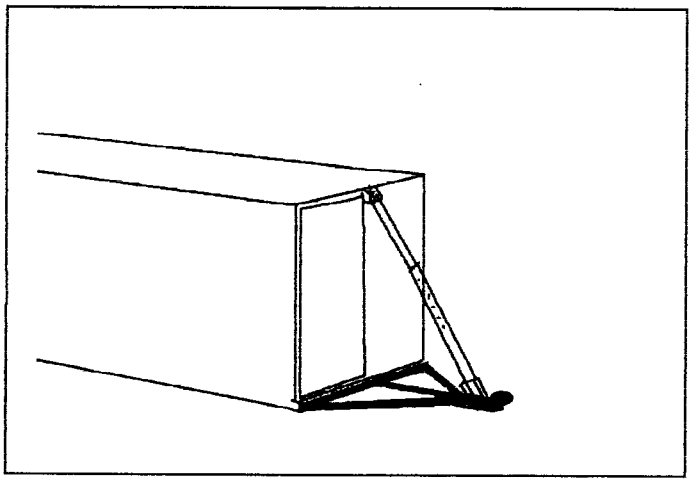
By Peter Champness

Like the Foot Launched Glider series some years ago the ideas on trailer improvements just go on and on. The ideas are not all mine. Indeed most of them have been suggested by others. However since my glider trailer needs endless improvement I am always on the lookout for simple ways to load and unload the glider and to improve the towing of the trailer.

One issue common to many homebuilt and vintage glider trailers is a tilting mechanism. The purpose of tilting the trailer is to straighten the angle between the loading ramp and the floor of the trailer so that the glider can be rolled in on its wheel without grounding the fuselage on the rear edge of the trailer when the glider is half way in.

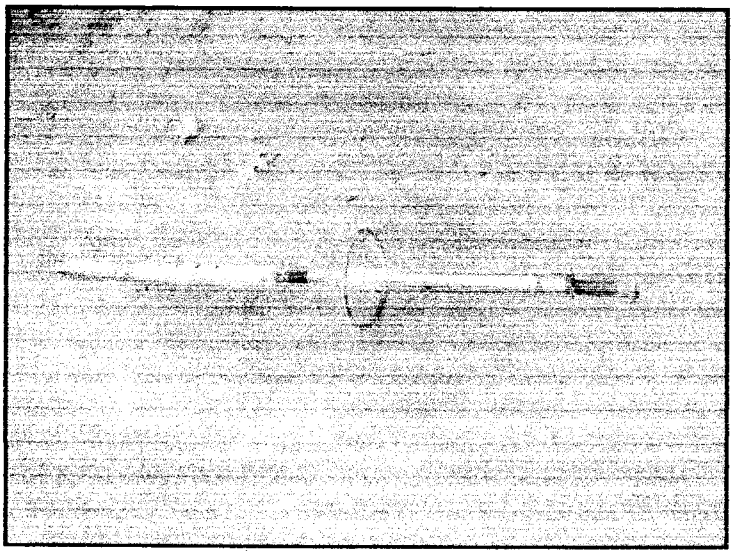
On my glider trailer the tilting mechanism consists of a triangular frame drawbar which is hinged at the front edge of the trailer. A strut is placed between the top edge of the trailer and the front of the drawbar. Altering the length of the strut causes the trailer to tilt.

When I purchased the glider (with trailer), the strut consisted of two concentric pieces of round water pipe, one sliding inside the other. A series of holes were drilled in each pipe and when the trailer was tilted to an appropriate angle the holes lined up and a bolt could be placed though the holes, fixing the length of the strut and keeping the trailer tilted at a fixed angle. The means of raising the front of the trailer was to bend down and seize the front edge of the trailer and attempt to lift it using all one's strength. When the holes lined up one had to twist half round, try to hold the trailer up with one hand and push the bolt through with the other. Since the weight on the tow ball of the fully laden trailer is fairly heavy this was no easy feat. Despite the difficulty of performing this task on one's own the system remained in use for about 30 years.



After putting up with the sliding pipe system for several years I began looking about for a better idea. Having had some experience with farms and tractors I noticed the similarity of the trailer tilt and the three point linkage which supports machinery on the back of most tractors. The upper link of the three point linkage is analogous to the upper strut of my glider trailer. The upper link is a large turnbuckle (a length of pipe threaded at each end with a bolt screwed in to each end). Since the turnbuckle has a left hand thread at one end and a right hand thread at the other it has the property of lengthening when turned in one direction (both ends unscrew) and shortening when turned the other way (both ends screw in).

Tractor links must be damaged occasionally because they are available in farm machinery stores. I found one in a store in Benalla and purchased it for out $70 which I thought was quite reasonable. The adjustable link was of course designed for a tractor so it had a ring shaped fitting at each end which is designed for the connecting pins on the tractor and the machinery. These had to be cut off and the bottom end welded to the fitting at the tow ball end of the draw bar. The link was too short so I shortened the original sliding pipes and welded them to the top of the link This gave additional adjustment to the length of the strut if I got the measurements wrong. The adjustable link was turned by a spanner which engaged two small lugs on the central pipe section. This was rather inconvenient for my purpose so I had a circular ring welded to the middle with three struts, resembling a small steering wheel.

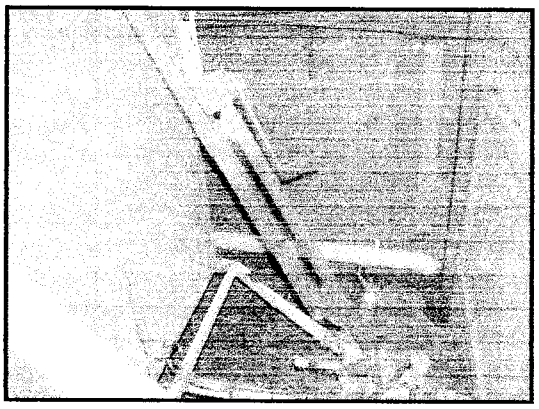


The new system worked quite well. By turning away at the steering wheel I could raise the front of the trailer until the tilt was satisfactory for loading then lower it again to the level position for towing. At least there was no back strain and no awkwardness in placing the bolt through the hole.
The new system however failed on two points. Firstly the range of movement provided by the link was only just adequate and I would occasionally wind it two far. When the bolt came out of the end of the screw the whole strut would collapse dropping the front of the trailer on the ground. The other problem was that the link required quite a few turns to adjust the length. Since I was able to turn the wheel about one third of a turn at a time it was a bit tiresome to make the adjustments.

I have more recently seen the system that **James Garay** has on his Woodstock trailer. James uses a car jack with a right angled drive to adjust the length of the strut. I decided that this system was easier to use and much faster in operation. It also had a greater range of adjustment and would solve the problem of the bolt unscrewing from the end of the link.

I obtained a suitable jack from a second hand car parts store. An old car bumper jack was obtained for $55 which was more than I wanted to pay. I am sure that similar jacks can be had for much less at garage sales etc but I didn't want to wait for a long time nor attend a lot of garage sales to find another so I bought it.

A new strut was constructed using the jack and some 40mm and 35mm square section steel. The job took most of a Saturday to complete but is quite an improvement over the previous system in operation. The jack is easy and quick to operate

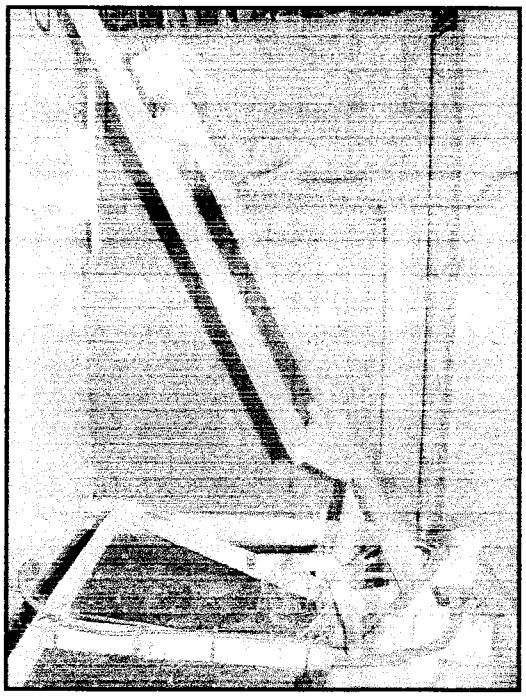


The next job is to relocate the spare wheel which will improve utility and maybe also improve the towing behavior of the trailer.

SMILE ☺

A few days before a proctological examination, a one eyed patient accidentally swallows his glass eye. He rings his regular GP who tells him not to worry, nature would take its course in due time. At the proctologist's office, the patient undress and bends over. Of course, the first thing the specialist sees when he looks up there is the glass eye staring back at him.

"You know Mr Price" says the doctor, 'You're really going to have learn to trust me'.



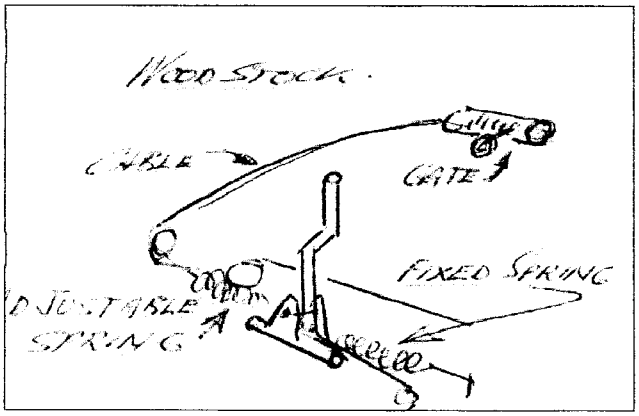
TRIMMING DEVICES

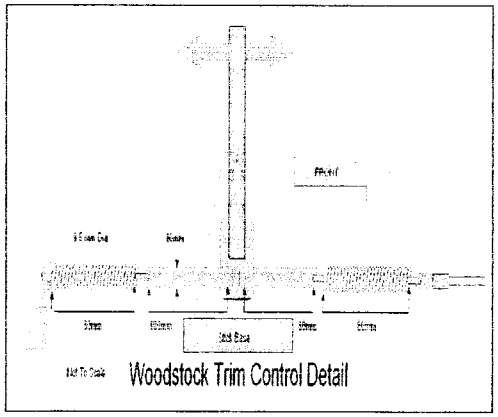
By M.Bee.

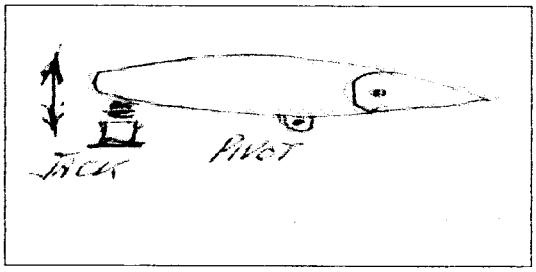
There is nothing more Off-putting in flying a plane than to have to hold pressure against a control to maintain a stable condition. So several methods of trimming have been devised to counter this force.

Spring trims in the form of coil springs are attached to the bottom of the control stick. – One fixed and tensioned, one extended via a cable so as to be able to vary the length of the apposing spring to bias the stick. This cable finishes in a gate or with friction device to hold the tension where set.

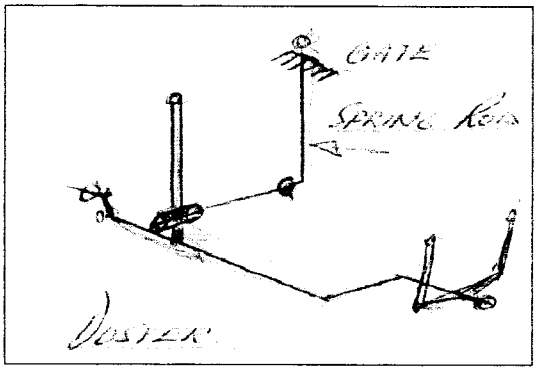
Woodstock has a spring tensioned and fixed behind the stick at the base, this pulls the bottom of the stick rearwards – therefore noes down and faster. The second spring, adjustable for tension pulls forward and therefore the neutral stick position is adjustable.



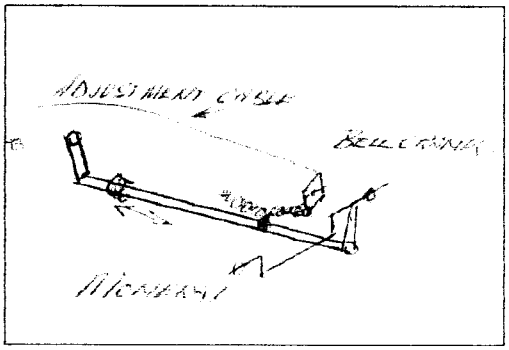




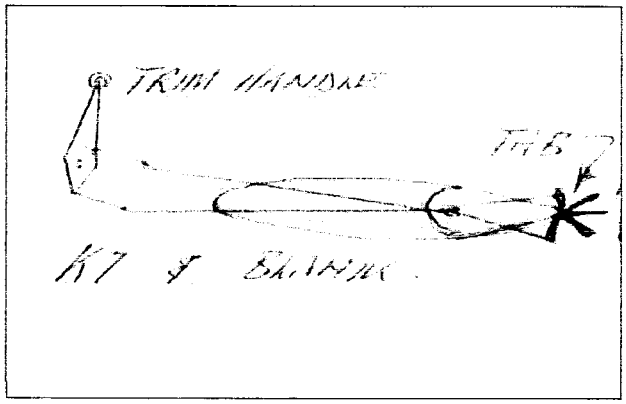
The Duster uses a spring steel torque rod anchored to the stick at the pivot passing across to the side of the cockpit through a deadeye bearing then up the wall with a gate at the top of the rod. The vertical section is in bending applying twisting to the section fixed to the sick, enabling adjustment of the desired neutral position.



The Monerai with sliding side stick configuration has two springs attached to the slide tube. One stretched forward – down stick and the other attached to the bell crank pulling back – up stick. The crank has a friction controlled cable attached and so up to the instrument panel.



Blaniks and many other older gliders have two cables running off to a trim tab hinged on the elevator that changes the angle of the tab to the main elevator thereby flying the elevator either up or down trimming out the neutral position as the pilot desires.



Any model aircraft builder has trimmed gliders and freeflight models by changing the angle of attack of the elevator stabiliser by adding or removing packing under the stabiliser.
The same can be done with full size aircraft and several power planes adjust trim with a screw jack under the stabiliser, which is mounted on pivots.
When constructing a homebuilt or repairing a damaged aircraft it is very important that the angle of attack of the elevator stab is accurately set in relation to the wings angle of attack or the neutral position to fly comfortably and stabily will fall outside the available trim power of the trim system.
When you set it right the plane is a joy to fly – when wrong it's twitchy and uncomfortable.
Happy Flying

A LITTLE BIT OF GLIDING IN AUSTRALIA
By Allan Ash

TASMANIA

The Tasmanian Glider Club came into being at a meeting in Launceston on September 1929. The first committee consisted of K. Howe (president). C.E Dixon (secretary and treasurer) and Messrs K.Kitt, G.B. Howe, N. Cave (instructor),, J.Yates, F.B. Wilmott, W. Mitchell and A.J. Russell.

A Zogling primary glider was built for the club by C.E. Dixon, a cabinet maker, who had previously built a hang glider in 1915. The glider was named ***Drag-an-Fly*** and was test-flown by Norm Cave, a power pilot, who was then given the task of teaching the members to fly it. Apart from the usual minor crashery associated with this form of training, the club made good progress until a cyclone blew down its hangar at White Hills, destroying the Zogling, which had logged more than 800 flights in less than two years.

Undaunted, the members set about building another Zogling named ***Drag-an-Fly 2*** and was test-flown in October 1932. A detachable nacelle was built for the Zogling which provided a slight improvement in performance for the more advanced pilots. After 125 flights, the machine was badly damaged when a member stalled it, then dived into the ground. The glider struck on one wing, cart wheeled onto its backs and hurled the unlucky pilot (after breaking his safety belt) headlong through the flimsy nacelle. He landed on his feet and escaped unhurt, apart from bruises. Stoically, the club members set about rebuilding the wrecked Zogling.

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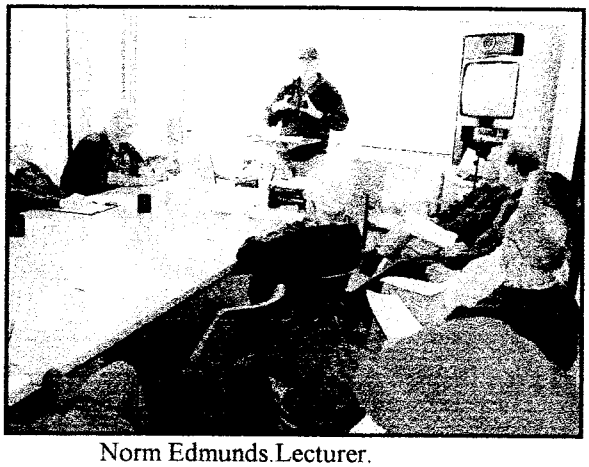
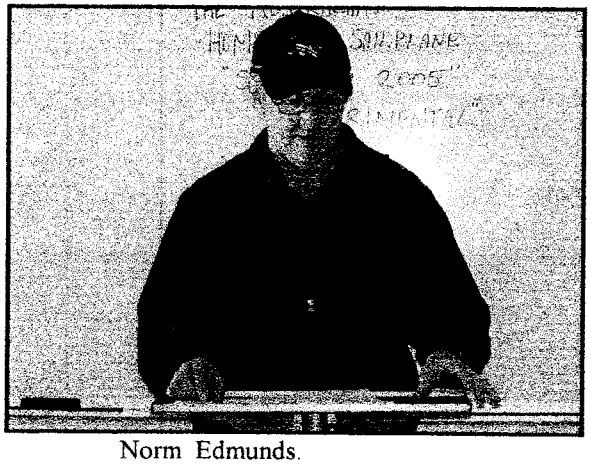


Norm Edmunds.Lecturer.

Guest Speaker John Ashford. GFA.CTO/A.



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